LEVER-ACTIVATED LOCK FOR TELESCOPING POLE

Cross-Reference to Related Application

This application claims priority from and hereby expressly incorporates by reference U.S. provisional application no. 60/258,433 filed December 27, 2000.

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Background of the Invention

The present invention relates to a lock for selectively fixedly securing sections of a telescoping pole relative to each other to prevent telescoping movement or rotational movement therebetween. The subject lock is similar to conventional locks of the same type, but includes a novel and unobvious lever-activated locking mechanism that is conveniently and infinitely adjustable. Conventional locks of this type are known to become overtightened and freeze in position so that they are difficult to loosen, or to loosen through use. Also, the torque needed to lock and unlock the mechanism on most conventional telescoping locks is very great, especially during unlocking. This high torque is detrimental to the user's body including his/her hands, wrists and associated ligaments, joints, etc. Often, these conventional locks become so set in the locked position that a tool (e.g., pliers or the like) must be used to unlock the device. These prior devices also sometimes are difficult to use in that it is not clear to the user which way the locking mechanism is to be turned for locking or unlocking. Thus, a need has been identified for a new and improved lock for a telescoping pole.

Summary of the Invention

In accordance with the present invention, a lock is provided for temporarily fixedly securing first and second associated pole sections in a telescoped arrangement. The lock includes a base defining an axially extending through-bore adapted for close sliding receipt of an end portion of a first associated pole section. A neck projects from the base. A collar defines an opening aligned with the axially extending through-bore of the base. The collar is connected to the neck and is adapted for close sliding receipt of a second associated pole section partially telescoped into said first associated pole section. The collar is defined by first and second collar portions connected to the neck and terminating in respective first and second ears arranged in spaced-apart relation to each other. The ears define respective first and second bores. A fastener extends through the first and second bores between the first and second ears. The fastener includes: (I) a head abutting the first ear; (ii) a first portion frictionally engaged with a portion of the first ear that defines the first bore to inhibit unintentional rotation of the fastener; and, (iii) a threaded distal end extending through the second bore defined in the second ear and projecting outwardly from the second ear. A lever has a head defining a threaded aperture that is threadably engaged with the threaded distal end of the fastener. The lever is movable rotatably relative to the threaded distal end of the fastener between an unlocked position, wherein said collar slidably receives and accommodates a second associated pole section, and a locked position, wherein the head of said lever is advanced on the threaded distal end of the fastener toward the head of the fastener and urges the second ear toward the first ear to constrict

the collar radially into frictional gripping engagement with a second associated pole section received in the collar.

In accordance with another aspect of the present invention, a telescoping pole apparatus is provided and includes a first pole section defining a first bore and a second pole section slidably located in the first bore of the first pole section in a telescoping arrangement. A lock is connected to the first pole section and is adapted to secure the second pole section axially relative to the first pole section. The lock, itself, includes a base defining an axial through-bore, wherein an end portion of the first pole section is located in the axial through-bore. A selectively radially constrictable and expandable collar is connected to the base and defines an opening aligned with the axial through-bore. The second pole section projects from the first bore of said first pole section and through the opening of the collar. The collar, when radially constricted, firmly engages and retains the second pole section in an axially and rotatably fixed position relative to the first pole section. A fastener is connected to the collar and is frictionally engaged with the collar so as to be restrained against unintended rotation relative to the collar. The fastener includes a threaded end that projects outwardly from the collar. A control member is provided and mates threadably with the threaded end of the fastener. The control member is selectively manually rotatable relative to the fastener in first and second directions to constrict and expand the collar radially, respectively.

In accordance with a further aspect of the present invention, a lock apparatus for fixedly securing first and second telescoping pole sections relative to each other is provided. The lock apparatus includes a first portion adapted for

connection to an end portion of a first associated pole section. The lock further includes a second portion connected to the first portion and defining a selectively constrictable collar adapted for receipt of a second associated pole section that is partially telescoped into the first associated pole section. The collar, when radially constricted, firmly engages and fixedly retains a second associated pole section received thereby. A screw is connected to the collar and includes a headed end and an opposite threaded end. A lever is operably coupled to the threaded end of the screw and is adapted for rotation in a first direction on the screw causing the lever to be advanced on the screw toward the headed end whereby the collar is radially constricted. The lever is also adapted for rotation in a second direction, opposite the first direction, whereby the lever moves away from the headed end of the screw and the collar resiliently radially expands.

One advantage of the present invention is the provision of a novel and unobvious lever-activated lock for a telescoping pole.

Another advantage of the present invention resides in the provision of a lock for a telescoping pole that includes a lever control member that is easily manipulated by a user.

A further advantage of the present invention is found in the provision of a lock for a telescoping pole wherein that lock is manually adjustable using a conventional screw-driver.

Still another advantage of the present invention is that user over-tightening is inhibited.

A further advantage of the present invention is that it includes a

minimum number of parts that simplify and reduce the cost of manufacturing.

A still further advantage of the present invention resides in the provision of a lever-activated lock for a telescoping pole that firmly and securing retains telescoping pole sections in an axially and rotatably fixed relationship relative to each other.

Still other benefits and advantages of the present invention will become apparent to those possessed of ordinary skill in the art to which the invention pertains upon reading and understanding this specification.

Brief Description of the Drawings

The present invention comprises a variety of components and arrangements of components. A preferred embodiment of the invention is illustrated in the accompanying drawings that form a part hereof and wherein:

FIGURE 1 is an end view of a lever-activated lock formed in accordance with the present invention;

FIGURE 2A is a side elevational view of a lever-activated lock formed in accordance with the present invention as taken along line 2-2 of FIGURE 1;

FIGURE 2B is similar to FIGURE 2A but illustrates only the body of the lever-activated lock;

FIGURE 3 illustrates a specialized screw that forms a part of the lever-activated lock of the present invention;

FIGURE 4 is a view similar to FIGURE 2, but showing the lever-activated lock body in section and showing associated pole sections upon which the

lock operates; and,

FIGURE 5 is a view taken along line 5-5 of FIGURE 4.

Detailed Description of Preferred Embodiments

Referring now to the drawings, a lever-activated lock formed in accordance with a preferred embodiment of the present invention is shown at **10**. The lock comprises a body **20** having a base **30** and a collar **50**. The body **20** is preferably defined as a one-piece molded plastic construction.

Telescoping poles are generally tubular members and, thus, the base **30** is preferably an annular member that defines an axial through-bore **32**. The bore **32** includes a first, enlarged portion **34** that is dimensioned and conformed for close, sliding receipt of an end portion **E1** of a first pole section **P1** therein as shown in FIGURE 4. The end **E1** is preferably adhesively and/or mechanically secured in the enlarged portion **34** of the bore **32**. A radially inwardly extending shoulder **36** is defined at the transition between the enlarged first portion **34** of the bore and the remaining second portion **38** of the bore **32**. The shoulder **36** provides a stop for abutment of the pole section **P1** thereagainst when the end **E1** of the pole section is fully inserted into the enlarged bore portion **34** as shown in FIGURE 4. Furthermore, with the base **30** operatively secured to the pole section **P1** as shown in FIGURE 4, the second portion **38** of the bore is aligned with the bore **B1** formed through the pole section **P1**. The dimensions of the base **30** can vary, but one of ordinary skill in the art will recognize that it must have sufficient axial length to accommodate a sufficient length of the end **E1** of the pole section **P1** so that a

strong connection between these two members is possible and so that the base **30** does not fracture under loads encountered for the expected application of the telescoping pole, e.g., window washing, light bulb changing, etc.

The collar **50** of the body **20** is connected to the base **30** by a narrow neck **52** so that a substantial portion of the collar **50** is separated from the base **30** by a space **54.** This space **54** allows for radial constriction and expansion of the collar **50** relative to the base **30** as described below.

Referring to FIGURES 1 and 5, the collar **50** is also preferably conformed as an annular member, but it is split so that a circumferential gap **56** is defined between first and second collar halves **60a,60b**. More particularly, each collar half **60a,60b** originates at the neck **52** and terminates in an ear **62a,62b**, respectively. The ears **62a,62b** are arranged parallel and spaced-apart from each other. Movement of the ears **62a,62b** together causes the collar **50** to constrict radially while movement of the ears **62a,62b** away from each other causes radial enlargement of the collar **50**.

The collar **50** also defines an opening or bore **70** therethrough that is coaxial with the bore **32** defined in the base **30**. The opening **70** is dimensioned and conformed for close sliding receipt of a second pole section **P2** (FIGURE 4) therein when the collar halves **60a,60b** are in a free, relaxed position, i.e., when the collar **50** is neither constricted nor enlarged. The collar **50** is defined to have an axial length that is sufficient to provide the collar with required strength and also so that the inner surface **72** defining the opening **70** contacts a sufficient axial length of the pole section **P2** to grip same when the collar is constricted. As shown in

FIGURE 4, when the second pole section **P2** is slidably inserted into the collar **50**, the second pole section **P2** telescopes through the base **30** and into the bore **B1** of the first pole section **P1**.

The lock **10** includes a locking mechanism for selectively constricting the collar **50** about the pole section **P2** to prevent sliding movement of the pole section **P2** relative to the collar. In the illustrated embodiment, the ears **62a,62b** define respective aligned unthreaded apertures **64a,64b**. A fastener such as a screw **80** is inserted into and through theses aligned apertures so that the screw head **82** abuts the ear **62a** and so that the threaded distal end **84** of the screw **80** projects through the ear **62b**. With brief reference to FIGURE 3, it is most preferred that the screw **80** be conformed as shown to have a proximal portion **86** adjacent the head **82** that is purely cylindrical and unthreaded. This proximal screw portion **86** and the aperture **64a** defined in the ear **62a** are dimensioned relative to each other so that the proximal screw portion **86** is received in the aperture **64a** with a tight friction fit sufficient to prevent rotation of the screw **80** by means other than a tool acting on the head **82**. Thus, once the screw **80** is operatively installed in the lock **10** as shown, it is rotationally fixed in position unless manually rotated by a user with a screwdriver acting on the screw head **82**. Both apertures **64a,64b** are unthreaded. With particular reference again to FIGURE 3, it is most preferred that the distal end **84** of the screw **80** be threaded with a double-lead (two threads that start at two diametrically opposed positions on the distal screw end **84**), left-handed thread for reasons that will become apparent to those of ordinary skill in the art upon reading further.

The lock **10** comprises a control member such as a lever **90**. The lever includes a head **92** and a shank **94**. The shank **94** is preferably defined as a wide, flat tab adapted for receipt of manual force thereon. The head **92** includes a threaded aperture **96** defined therethrough. The threaded aperture **96** is adapted for coacting with the threaded distal end **84** of the fastener **80**. To assemble the lock **10**, the screw **80** is first pushed fully into the aligned apertures **64a,64b** until the screw head **82** abuts or nearly abuts the ear **62a**. The screw **80** is then rotated with a tool acting on the screw head **82** to advance the head **92** of the lever **90** onto the distal end **84** of the screw until the lever **90** abuts the ear **62b**. Of course, the lever **90** can be replaced by a thumb-screw or any other suitable control member that mates with the end **84** of the fastener **80** without departing from the overall scope and intent of the present invention.

Once the lock **10** is assembled as described, the screw **80** is frictionally fixed against further rotation owing to the friction fit of the proximal screw portion **86** in the aperture **64a** of the ear **62a**. In particular, the lever **90** is rotatably moveable on the screw **80** without causing rotation of the screw. Of course, other suitable means can be used to fix the screw **80** against unintended rotation without departing from the overall scope and intent of the present invention.

During the assembly process, the lever **90** is advanced onto the screw **80** a sufficient amount by rotation of the screw **80** so that when assembly is complete, movement of the lever **90** to a first (unlocked) position (shown at 90-1 in FIGURE 4) causes the lever **90** to be retracted on the screw **80** so that the collar halves **60a,60b** move apart due to their natural resilience a sufficient amount so that

the pole **P2** is able to slide freely relative to the collar **50**. Furthermore, when the lever **90** is moved from the first position **90-1** to a second (neutral) position **90-2**, it is preferred that the pole **P2** still be movable axially and rotationally relative to the collar **50**. On the other hand, movement of the lever **90** from the neutral position **90-2** to a third (locked) position (shown at **90-3** in FIGURE 4) causes the lever **90** to be advanced on the screw **80** a sufficient amount so that the lever **90** bears against the ear **62b** and so that the screw head **82** bears against the ear **62a** whereby the ears **62a,62b** move toward each other a sufficient distance to constrict the collar **50** and prevent sliding and/or rotational movement of the pole section **P2** relative to the collar **50**. A user can use a screwdriver or like tool to rotate the screw **80** periodically to adjust the position of the lever **90** on the screw **80** so that the first, second and third lever positions are properly defined even after repetitive movement of the lever **90** between the first, second and third positions. It is most preferred that the lever **90** abut the body **20** when moved from the neutral position **90-2** to the locked position **90-3** to prevent over-tightening of the collar **50** about the pole section **P2**.

The preferred double-lead thread on the screw **80** provides for maximum axial displacement of the lever **90** on the screw **80** when the lever **90** is rotated between its first, second and third operative positions. The left-hand thread allows for proper orientation of the lever relative to the poles **P1,P2** and proper orientation of the first and second positions. Of course, the invention is not to be construed as limited to use of a left-hand and/or a double-lead screw **80**.

The invention has been described with reference to preferred

embodiments. Modifications will occur to those of ordinary skill in the art to which the invention pertains upon reading this specification. It is intended that the following claims be construed as encompassing all such modifications.